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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/625,893	07/26/2000	Donald Wayne Allen	TH1258 (US)	8026

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Mark A Smith
c/o Shell Oil Company
Intellectual Property
PO Box 2463
Houston, TX 77252-2463

EXAMINER

MITCHELL, KATHERINE W

ART UNIT PAPER NUMBER

3677

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/625,893

Applicant(s)

ALLEN

Examiner

Katherine W. Mitchell

Art Unit

3677

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 1/3/05
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Examiner notes for the record the exceptional cooperation and professionalism of applicant and applicant's attorney in prosecuting the application.

Claim Objections

1. Claim 4 line 6, "the sleeve" lacks antecedent basis. Examiner is not sure what is meant by "including the sleeve" since there is no sleeve.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant's Declaration filed 9/3/2002 states in paragraph 13 that the Allen paper teaches that cylinder with a k/D in the range of $1.21 - 1.51 \times 10^{-4}$ without a strongback had increased vortex induced vibration (VIV) and increased drag. The smooth PVC cylinder with k/D 8.86×10^{-5} to 1.09×10^{-4} without a strongback is also described as displaying substantial vibration and significant decreased drag.

If examiner accepts that the Allen paper requires the cylindrical element to be or include a support or strongback to reduce the VIV, then a full consideration of this argument results in an apparent contradiction of the pending claims functionality and

Art Unit: 3677

enablement. There is no additional limitation in the pending claims to explain why the same structure that is specifically noted as **not** reducing/controlling drag and VIV can be used to successfully control drag and VIV. Thus either there is an enabling step or feature missing, or the claimed invention cannot work.

The newly-submitted Declaration of 31 Jan 2005 by Dr. Allen notes that there may have been sampling and testing errors due to small sample sets and non-controlled variables such as rough handling. The only limitation taught is providing a substantially cylindrical marine element consisting of an ultra-smooth surface with a k/D value of 1×10^{-4} or less, which is met in the Allen paper. However, the Allen paper teaches the k/D parameter claimed, and addresses the control of drag and vortex induced vibration (Summary, page 684), even if it does not document repeatable or accurate results in all cases. Examiner notes that “control” of drag and vortex-induced vibration does not require reducing VIV and drag – the control can include merely affecting or influencing:

con·trol (kən-trōl') *verb, transitive*

1. To exercise authoritative or dominating influence over; direct. See synonyms at conduct.
2. To hold in restraint; check: *struggled to control my temper; regulations intended to control prices.*
3.
 - a. To verify or regulate (a scientific experiment) by conducting a parallel experiment or by comparing with another standard.
 - b. To verify (an account, for example) by using a duplicate register for comparison.¹

¹Excerpted from *The American Heritage Dictionary of the English Language, Third Edition* Copyright © 1992 by Houghton Mifflin Company. Electronic version licensed from Lernout & Hauspie Speech Products N.V., further reproduction and distribution restricted in accordance with the Copyright Law of the United States. All rights reserved.

Art Unit: 3677

Thus it appears to examiner that an enabling step is missing – the pipe must be specially handled with special surface preparation to maintain uniform surface smoothness (in addition to the low surface roughness) is required, or they must be filament wound to greatly minimize ovality (as opposed to “off-the-shelf round” pipes). As best understood by examiner, it appears declarant is stating that non uniformity of smoothness, even if all the k/D values are of 1×10^{-4} or less, can affect the results such that drag and VIV are not reduced. However, this limitation is not in the claims, and reduction is not required.

Double Patenting

4. The Terminal Disclaimer has been entered and the Double patenting rejections cancelled. However, examiner has noticed that there is a minor typing error in the Terminal Disclaimer. The next to last line on page 1 refers to U.S. 6,702,076, but it should be 6,702,026 as it is elsewhere throughout the Terminal Disclaimer. A corrected Terminal Disclaimer with the correction should be submitted.

Claim Rejections – 35 U.S.C. 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3677

6. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as obvious over Allen and Hennings's paper, *Vortex-Induced Vibration Tests of a Flexible Smooth Cylinder at Supercritical Reynolds Numbers*, May 1997, hereafter called the Allen et al. paper.

Re claims 1 and 4: The Allen et al. paper teaches on page 681, col 1, 2nd - 4th full paragraphs a method and system for controlling drag and vortex induced vibration (VIV), consisting of providing an ultra-smooth surface about the cylinder element of ABS® or PVC plastic with a surface roughness k/D between 8.86×10^{-5} to 1.51×10^{-4} . Since the structure disclosed in the Allen paper is the same as that claimed by applicant, and the structure as claimed can include no other elements, the structure must inevitably perform in the same manner. Applicant claims substantially cylindrical element with an exterior surface that has a K/D value of about 1×10^{-4} or less, which 8.86×10^{-5} clearly meets. The method is inherently taught by the structure.

7. Claims 2-3 and 5-6 are rejected under 35 U.S.C. 103(a) as obvious over the Allen et al. paper in view of Gregory, US Patent 4470722.

Re claims 2 and 5: As discussed above, the Allen et al paper teaches all the elements except that the ultra-smooth surface can be a coating. Gregory teaches in column 4 lines 59-65 a cylindrical housing element for use with a marine production facility that has an exterior coating of fiberglass or plastic. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Allen et al. paper to include or provide smooth surfaces of 1×10^{-4} or less, including 8.86×10^{-5} or less as taught in the Allen et al. paper, as a coating on a substantially cylindrical element, as taught by Gregory, in order to minimize the

Art Unit: 3677

additional costs and labor required in obtaining an ultra-smooth surface, as an existing structure can be converted to an ultra-smooth one without being removed and replaced. The method is inevitably taught by the apparatus as shown installed.

Re claims 3 and 6: As discussed above, the Allen et al paper teaches all the elements except that the ultra-smooth surface can be a sleeve. A sleeve is an obvious variant of a coating or cylindrical surface. Examiner notes that Gregory teaches in col 2 lines 15-23 that fairings (sleeves) are commonly known to suppress VIV of a single riser. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Allen et al. paper to include or provide smooth surfaces of 1×10^{-4} or less, including 8.86×10^{-5} or less as taught in the Allen et al. paper, as a sleeve on a substantially cylindrical element, as taught by Gregory, in order to minimize the additional costs and labor required in obtaining an ultra-smooth surface as an existing structure can be converted to an ultra-smooth one without being removed and replaced. The method is inevitably taught by the apparatus as shown installed.

Response to Arguments

8. Examiner accepts that the Allen paper requires the cylindrical element to be or include a support or strongback to **reduce** the VIV. However, a full consideration of this argument results in an apparent contradiction of the pending claims functionality. Applicant's Declaration filed 9/3/2002 states in paragraph 13 that the Allen paper teaches that cylinder with a k/D in the range of $1.21 -- 1.51 \times 10^{-4}$ without a strongback had increased VIV and increased drag. The smooth PVC cylinder with k/D 8.86×10^{-5}

Art Unit: 3677

to 1.09×10^{-4} without a strongback is also described as displaying substantial vibration and significant decreased drag.

9. There is no additional limitation in the pending claims to explain why the same structure that is specifically noted as **not** controlling drag and VIV can be used to successfully control drag and VIV. If the rejection falls in the claimed range, the structure allows the range to be achieved, so it must inherently exhibit the performance. Thus either there is an enabling step or feature missing, or the claimed invention cannot work. As noted above, the 31 Jan 2005 Declaration does explain that the results in the Allen paper could be explained by variations in smoothness, handling, and ovality of the pipe. However, applicant is claiming control, not reduction, of drag and VIV. Further, the claims recite only an ultra-smooth surface with k/D of 1×10^{-4} or less, and if special handling, perfect roundness, uniform smoothness or other variables are required for the system or method to work, then they must be claimed to be given weight.

10. Although applicant believes the samples were not representative of the overall smoothness, there is no evidence to that provided. Specific preparation is not claimed, specifically, no claim language drawn to the form of custom manufacture. Further, since the k/D falls within the claimed range, it doesn't matter what the custom manufacture was--the limitation is taught. Extrusion, ovality, and variation in cross section are all moot arguments, not being drawn to claim limitations.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 3677

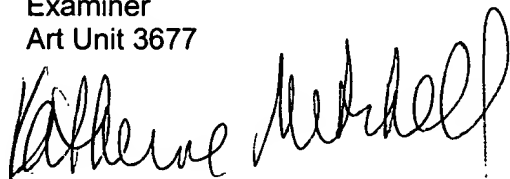
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine W. Mitchell whose telephone number is 571-272-7069. The examiner can normally be reached on Mon - Thurs 10 AM - 8 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. J. Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Katherine W Mitchell
Examiner
Art Unit 3677



Kwm
4/21/2005